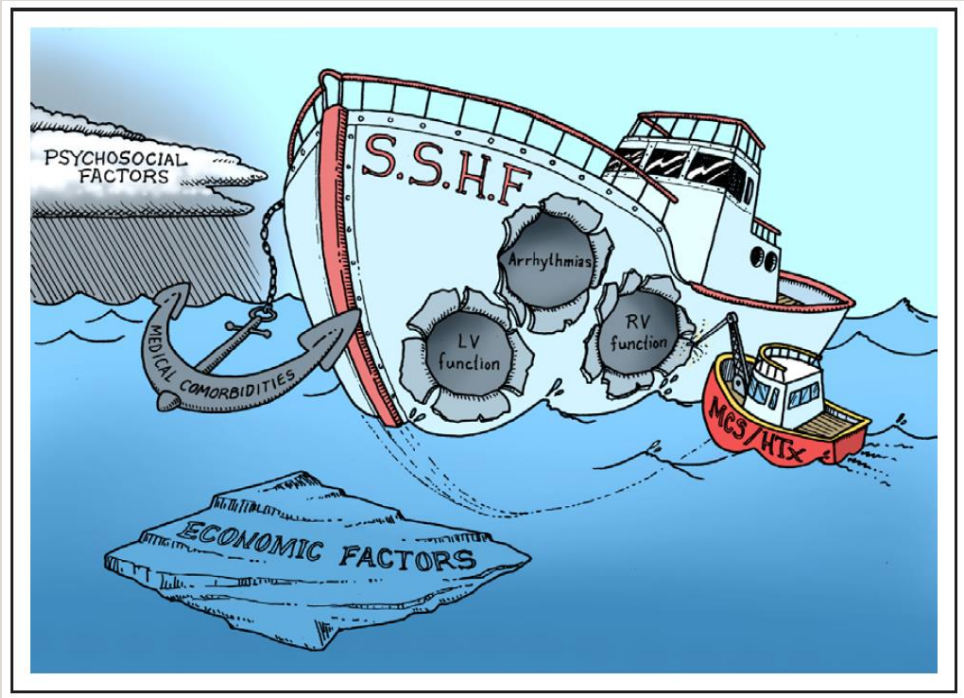
2022 AHA/ACC Guideline for the Management of Heart Failure



Onyedika Ilonze MD, MPH
Assistant Professor of Clinical Medicine
Indiana University
9/10/22 Indiana ACC

Disclosures

- NHLBI R25 HL105446
- Speaker: Bristol Myers Squibb

2022 HF Guidelines: A Patient-Centered Roadmap

- New definition of heart failure *(EF Agnostic?)*
  - *Common framework to improve care: New emphasis on HF primary prevention*
  - *Universal Classification by LVEF*
- The HFrEF to HFpEF spectrum of HF medical therapies
  - *Diagnostic aids (HFpEF*)*
  - *GDMT Arsenal for HFpEF*
- Quadruple HF Guideline directed medical therapies for HFrEF
  - *ARNI: First Line RASi (Class 1A)*
  - *New Class of Therapy: SGLTis (Class 1Q)*
  - *Minimize interruptions in GDMT*
- Timely diagnosis and Rx of Cardiac Amyloidosis
- Value-Based Statements of HF Medical Therapeutics
- Timely Referral for Consideration for Advanced Therapies
- Co-morbidity management:

Epidemiology of Heart Failure in the United States

Increase in HF related deaths from 2009 - 2014

Racial and ethnic disparities in death resulting from HF persist.

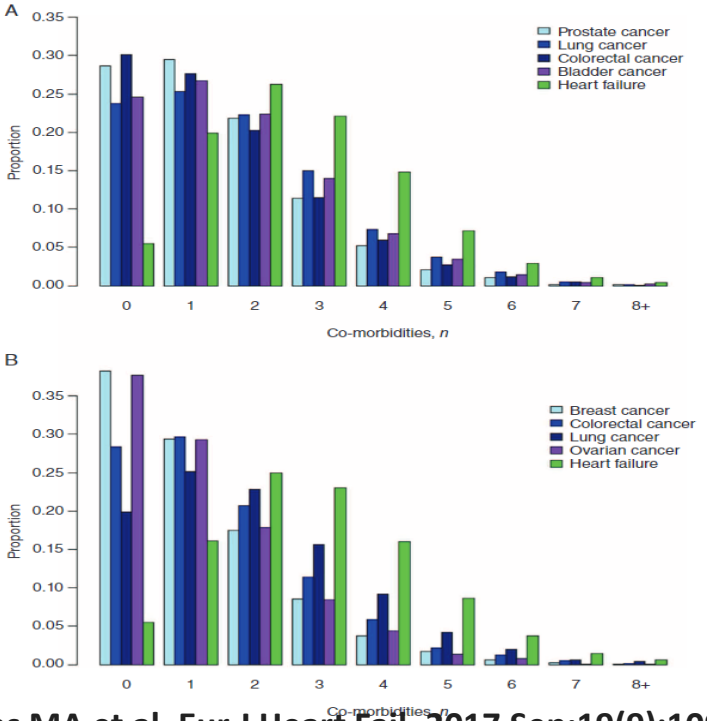
Increase in HF hospitalizations from 2013 to 2017.	Age-adjusted mortality rates for HF: *92/100,000 non-Hispanic Black patients* *87/100,000 non-Hispanic White patients* *53/100,000 Hispanic patients*

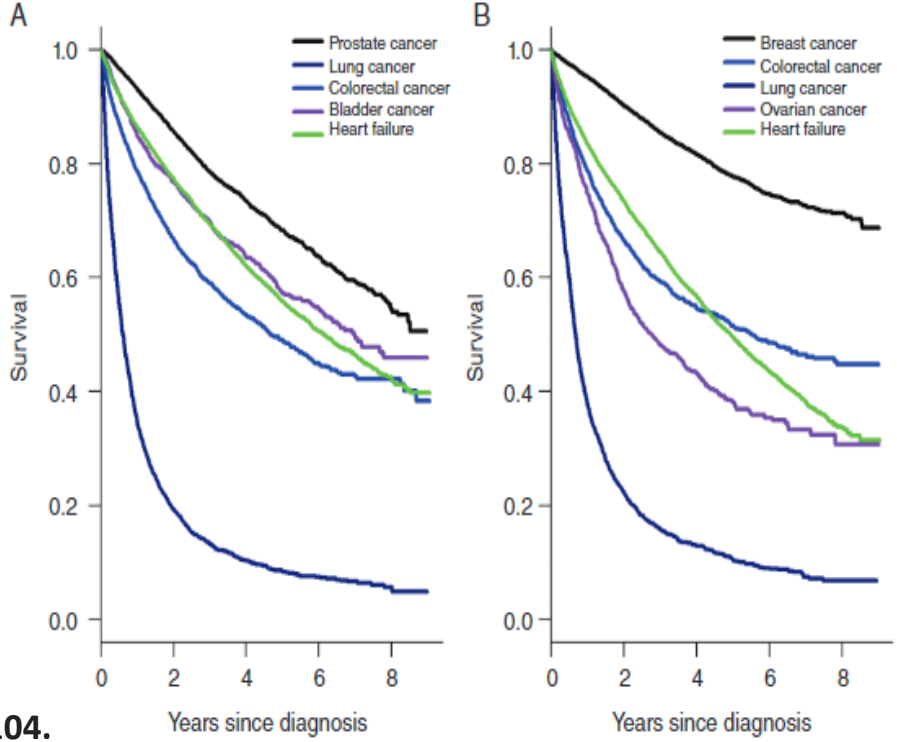
Decline in overall HF incidence from 2011 to 2014

Declining incidence of HFrEF but increasing incidence of HFpEF.

Disparities in racial and ethnic HF outcomes warrant studies and health policy changes to address health inequity.

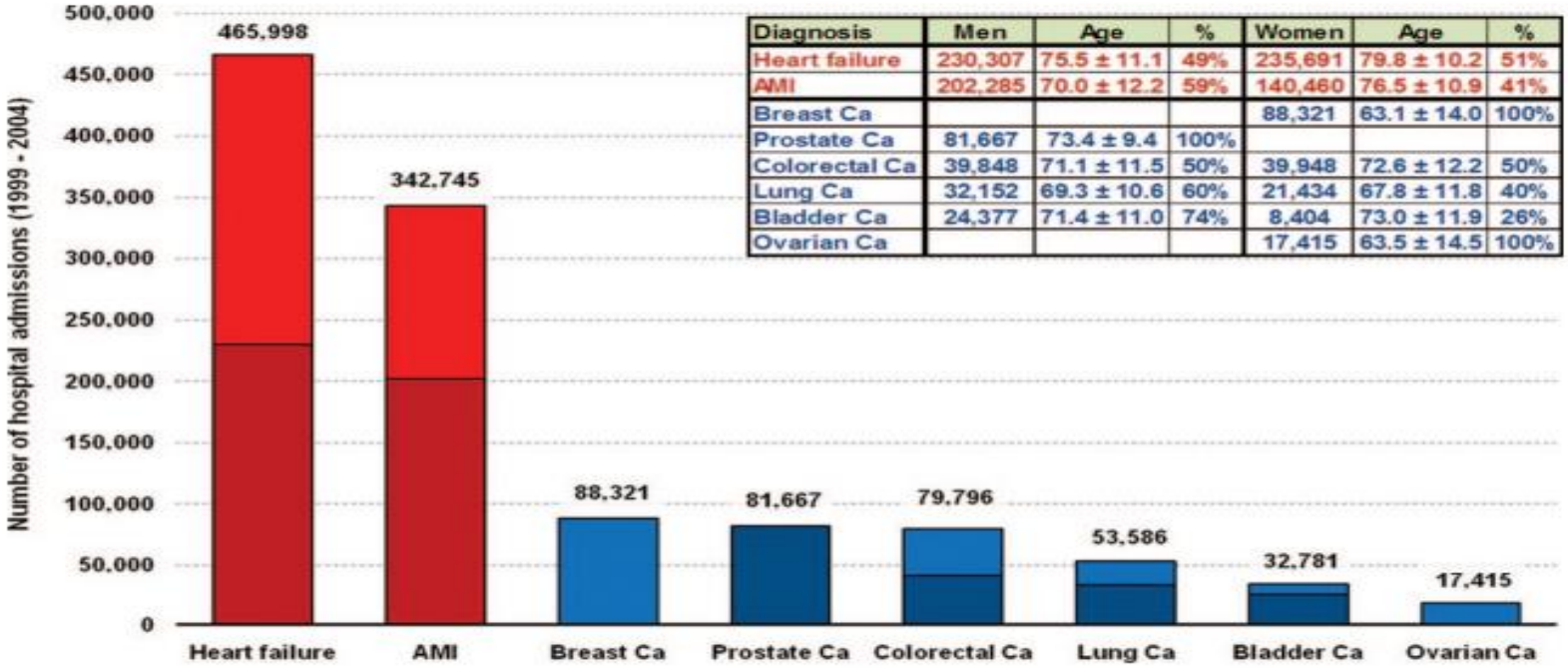
Is HF Mortality Worse than Cancer Mortality?





Mamas MA et al. Eur J Heart Fail. 2017 Sep;19(9):1095-1104.

Is HF Burden Worse than Cancer Burden?



Diagnosis	Men	Age	%	Women	Age	%
Heart failure	230,307	75.5 ± 11.1	49%	235,691	79.8 ± 10.2	51%
AMI	202,285	70.0 ± 12.2	59%	140,460	76.5 ± 10.9	41%
Breast Ca				88,321	63.1 ± 14.0	100%
Prostate Ca	81,667	73.4 ± 9.4	100%			
Colorectal Ca	39,848	71.1 ± 11.5	50%	39,948	72.6 ± 12.2	50%
Lung Ca	32,152	69.3 ± 10.6	60%	21,434	67.8 ± 11.8	40%
Bladder Ca	24,377	71.4 ± 11.0	74%	8,404	73.0 ± 11.9	26%
Ovarian Ca				17,415	63.5 ± 14.5	100%

Stewart S et al. Circ Cardiov Qual Outco. 2010 Nov;3(6):573-80.

- **UNIVERSAL DEFINITION OF HF**
  HF is a clinical syndrome with current or prior

  - **Symptoms and/or signs (*Table 6*) caused by a structural and/or functional cardiac abnormality (as determined by EF <50%, abnormal cardiac chamber enlargement, E/E′ >15, moderate/severe ventricular hypertrophy or moderate/severe valvular obstructive or regurgitant lesion)**
  - **and corroborated by *at least one* of the following:**

    - Elevated natriuretic peptide levels (for values refer to *Table 7*)
    - Objective evidence of cardiogenic pulmonary or systemic congestion by diagnostic modalities such as imaging (e.g. by chest X-ray or elevated filling pressures by echocardiography) or haemodynamic measurement (e.g. right heart catheterization, pulmonary artery catheter) at rest or with provocation (e.g. exercise).

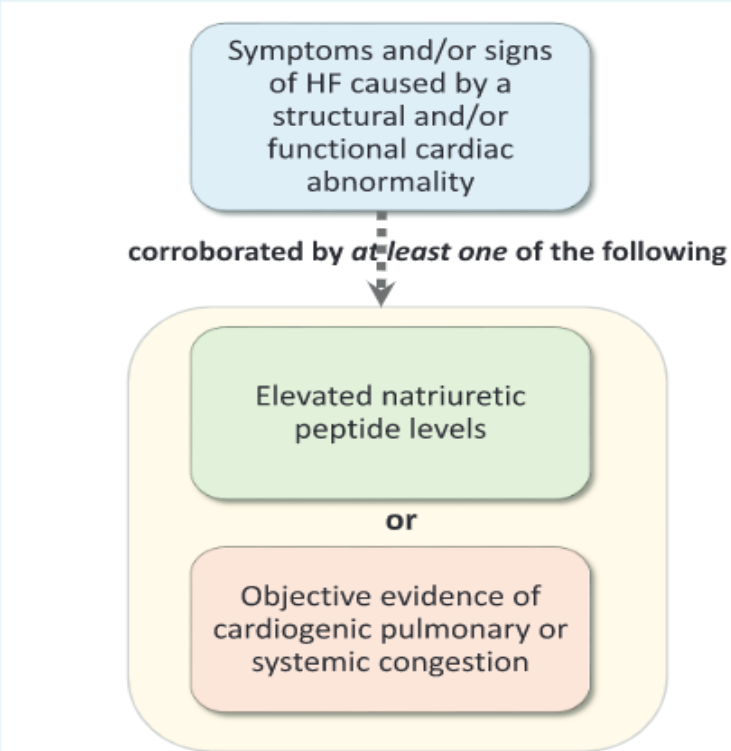
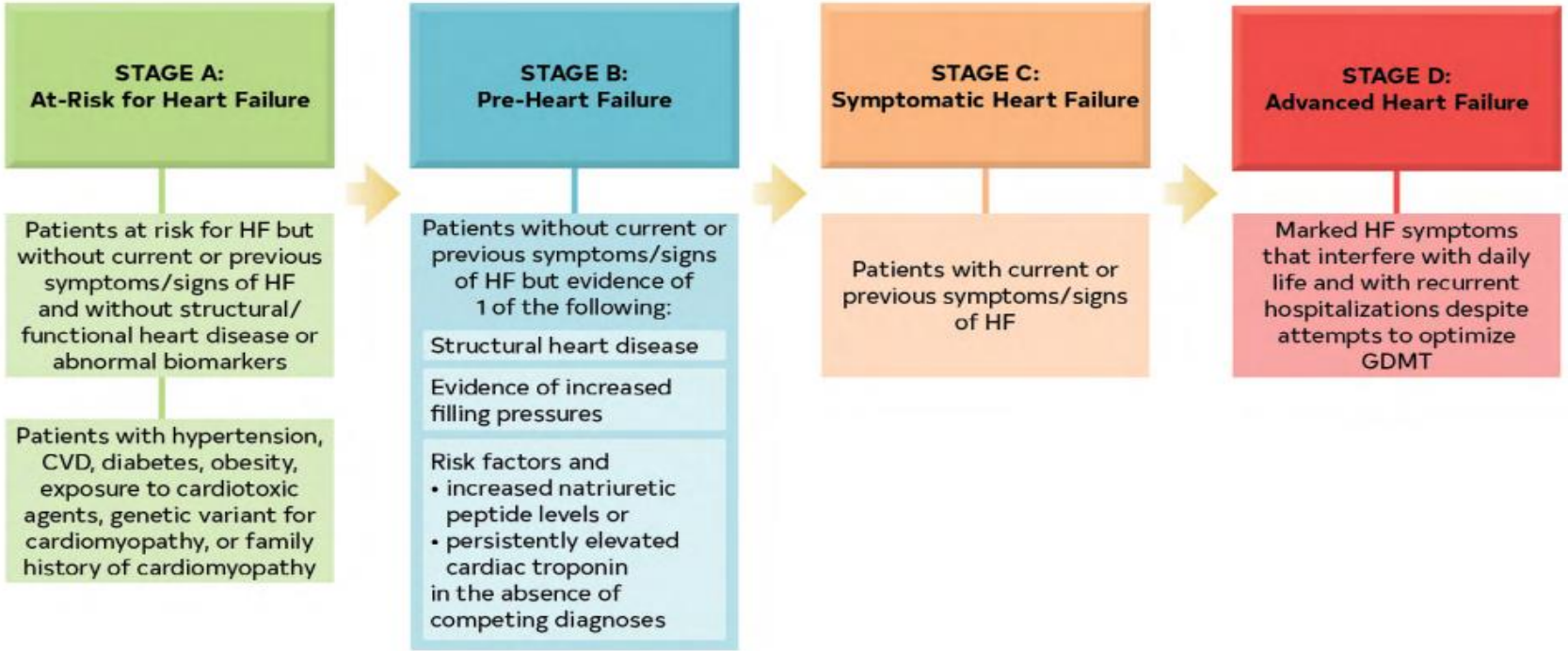


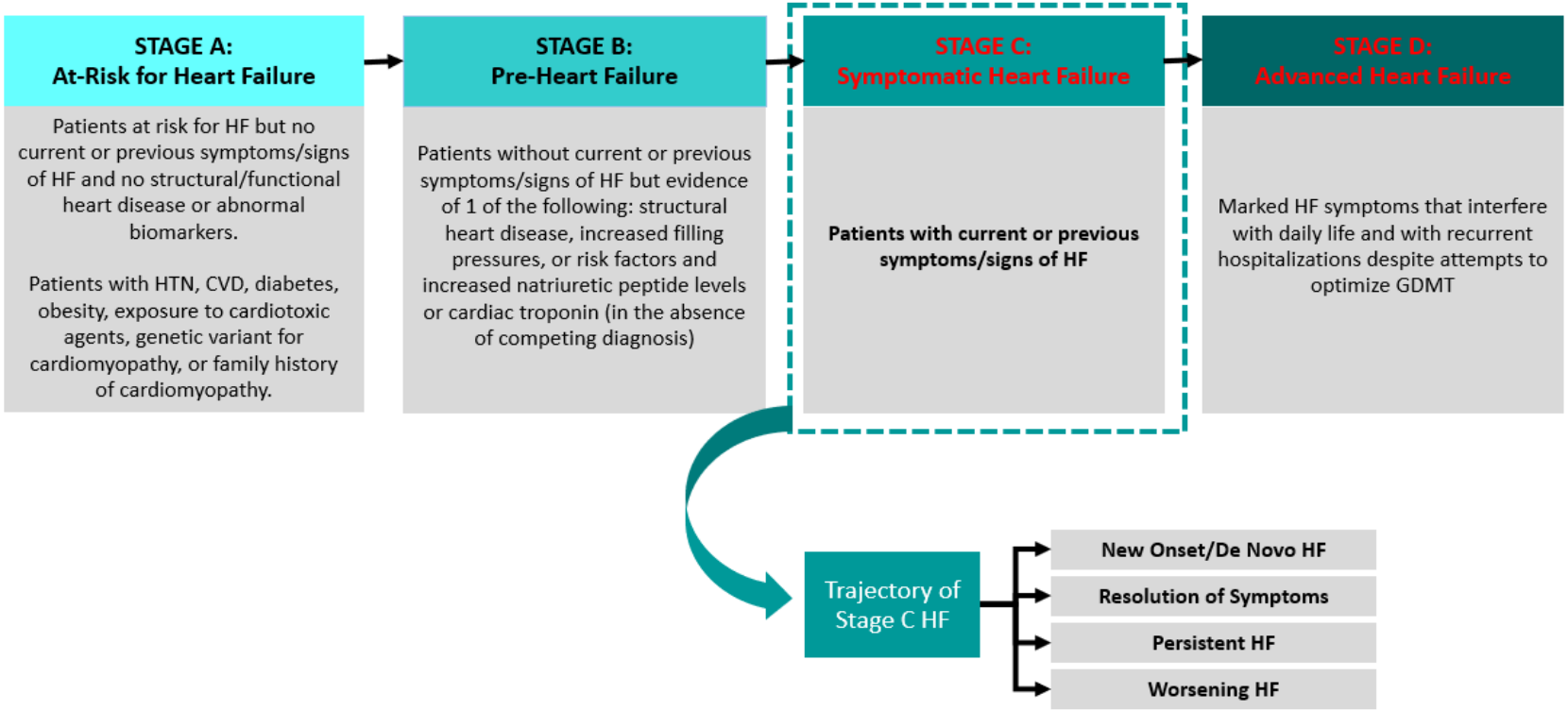
Figure 1 Universal definition of heart failure (HF).

Bozkurt B, et al. (2021) Universal Definition and Classification of Heart Failure: *J Card Fail*.

Stages of HF


STAGE A:
At-Risk for Heart Failure
Patients at risk for HF but without current or previous symptoms/signs of HF and without structural/ functional heart disease or abnormal biomarkers
Patients with hypertension, CVD, diabetes, obesity, exposure to cardiotoxic agents, genetic variant for cardiomyopathy, or family history of cardiomyopathy
STAGE B:
Pre-Heart Failure
Patients without current or previous symptoms/signs of HF but evidence of 1 of the following:
Structural heart disease
Evidence of increased filling pressures
Risk factors and
• increased natriuretic peptide levels or
• persistently elevated cardiac troponin
in the absence of competing diagnoses
STAGE C:
Symptomatic Heart Failure
Patients with current or previous symptoms/signs of HF
STAGE D:
Advanced Heart Failure
Marked HF symptoms that interfere with daily life and with recurrent hospitalizations despite attempts to optimize GDMT

Stages of HF


STAGE A:
At-Risk for Heart Failure
Patients at risk for HF but no current or previous symptoms/signs of HF and no structural/functional heart disease or abnormal biomarkers.
Patients with HTN, CVD, diabetes, obesity, exposure to cardiotoxic agents, genetic variant for cardiomyopathy, or family history of cardiomyopathy.
STAGE B:
Pre-Heart Failure
Patients without current or previous symptoms/signs of HF but evidence of 1 of the following: structural heart disease, increased filling pressures, or risk factors and increased natriuretic peptide levels or cardiac troponin (in the absence of competing diagnosis)
STAGE C:
Symptomatic Heart Failure
Patients with current or previous symptoms/signs of HF
STAGE D:
Advanced Heart Failure
Marked HF symptoms that interfere with daily life and with recurrent hospitalizations despite attempts to optimize GDMT
Trajectory of Stage C HF
New Onset/De Novo HF
Resolution of Symptoms
Persistent HF
Worsening HF

At Risk for HF and Pre-Clinical HF

Stages	Definition and Criteria
Stage A: At Risk for HF	At risk for HF but without symptoms, structural heart disease, or cardiac biomarkers of stretch or injury (eg, patients with hypertension, atherosclerotic CVD, diabetes, metabolic syndrome and obesity, exposure to cardiotoxic agents, genetic variant for cardiomyopathy, or positive family history of cardiomyopathy).
Stage B: Pre-HF	No symptoms or signs of HF and evidence of 1 of the following:
	*Structural heart disease** Reduced left or right ventricular systolic function Reduced ejection fraction, reduced strain Ventricular hypertrophy Chamber enlargement Wall motion abnormalities Valvular heart disease
	*Evidence for increased filling pressures** By invasive hemodynamic measurements By noninvasive imaging suggesting elevated filling pressures (eg, Doppler echocardiography)
	Patients with risk factors and *Increased levels of BNPs* or* *Persistently elevated cardiac troponin* in the absence of competing diagnoses resulting in such biomarker elevations such as acute coronary syndrome, CKD, pulmonary embolus, or myopericarditis
Stage C: Symptomatic HF	Structural heart disease with current or previous symptoms of HF.
Stage D: Advanced HF	Marked HF symptoms that interfere with daily life and with recurrent hospitalizations despite attempts to optimize GDMT.

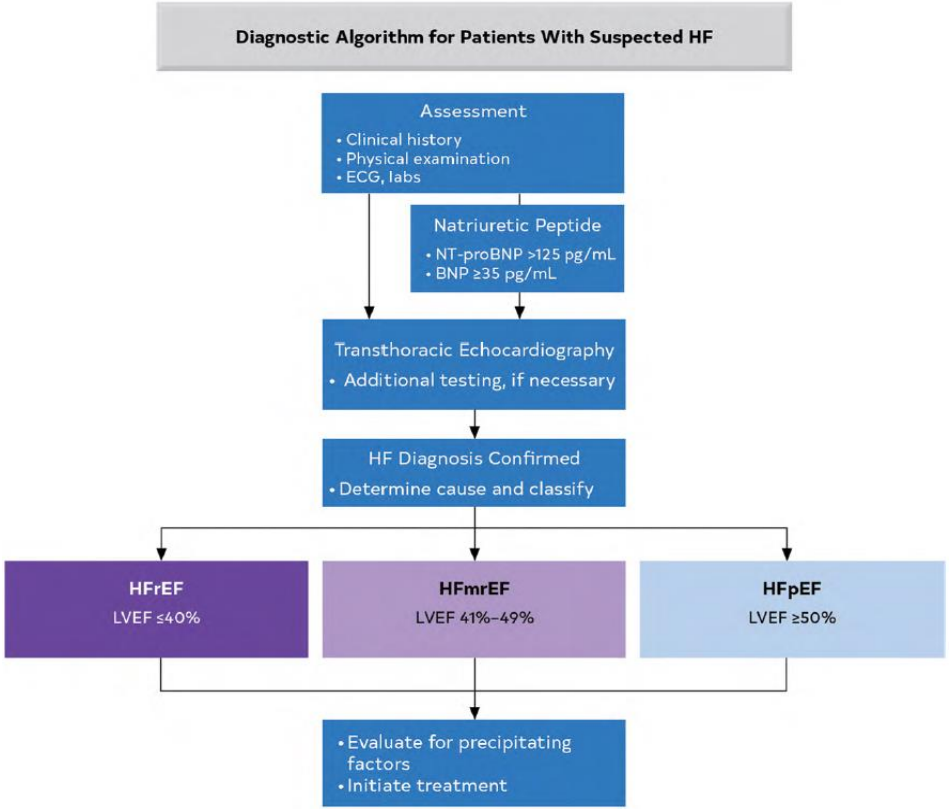
Classification of HF by LVEF

Type of HF According to LVEF	Criteria
HFrEF (HF with reduced EF)	LVEF ≤40%
HFimpEF (HF with improved EF)	Previous LVEF ≤40% and a follow-up measurement of LVEF >40%
HFmrEF (HF with mildly reduced EF)	LVEF 41%–49% Evidence of spontaneous or provokable increased LV filling pressures (eg, elevated natriuretic peptide, noninvasive and invasive hemodynamic measurement)
HFpEF (HF with preserved EF)	LVEF ≥50% Evidence of spontaneous or provokable increased LV filling pressures (eg, elevated natriuretic peptide, noninvasive and invasive hemodynamic measurement)

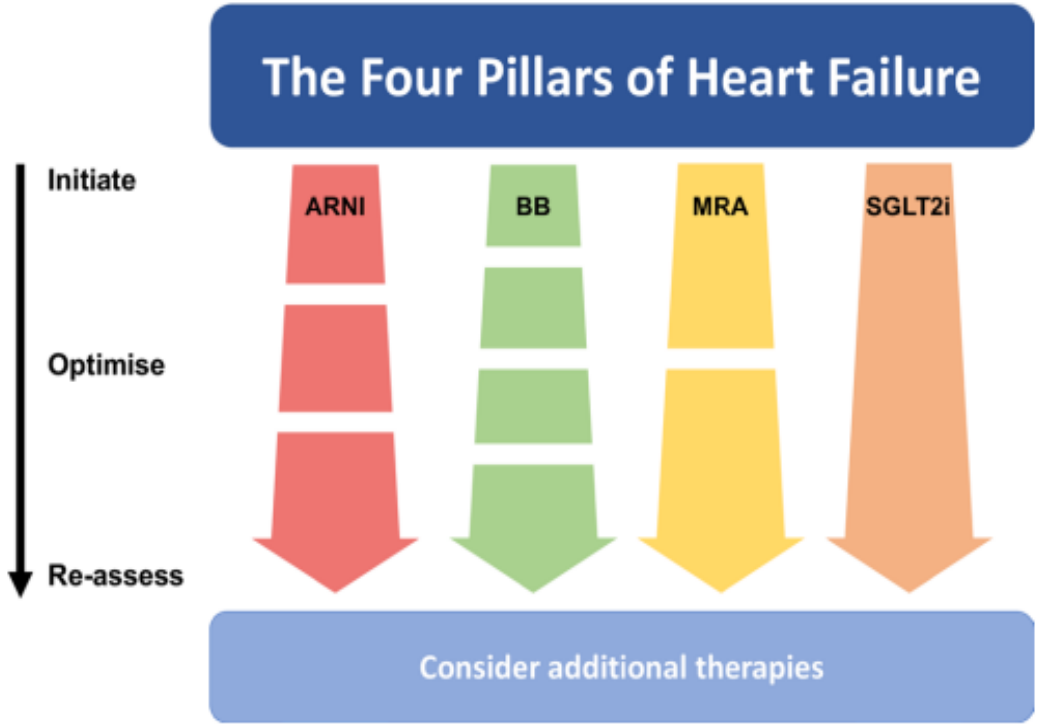
- H_2FPEF or HFA-PEFF Score
- SGLT2i – Efficacy on HFpEF and HFrEF

Diagnostic Algorithm for HF Definition of HF

- **CLASS I RECOMMENDATIONS**
  - H&to direct diagnostic strategies
  - HF Staging/Disease Severity
  - *3-generation family history*
  - Lifestyle and social determinants of health
  - *Evaluate for the presence of advanced HF*
  - Echo/LVEF assessment
  - ECG, CXR
  - Labs: CBC, BMP, lipid, TSH, *iron studies,*
  - Labs: LFTs, BNP/NT-proBNP

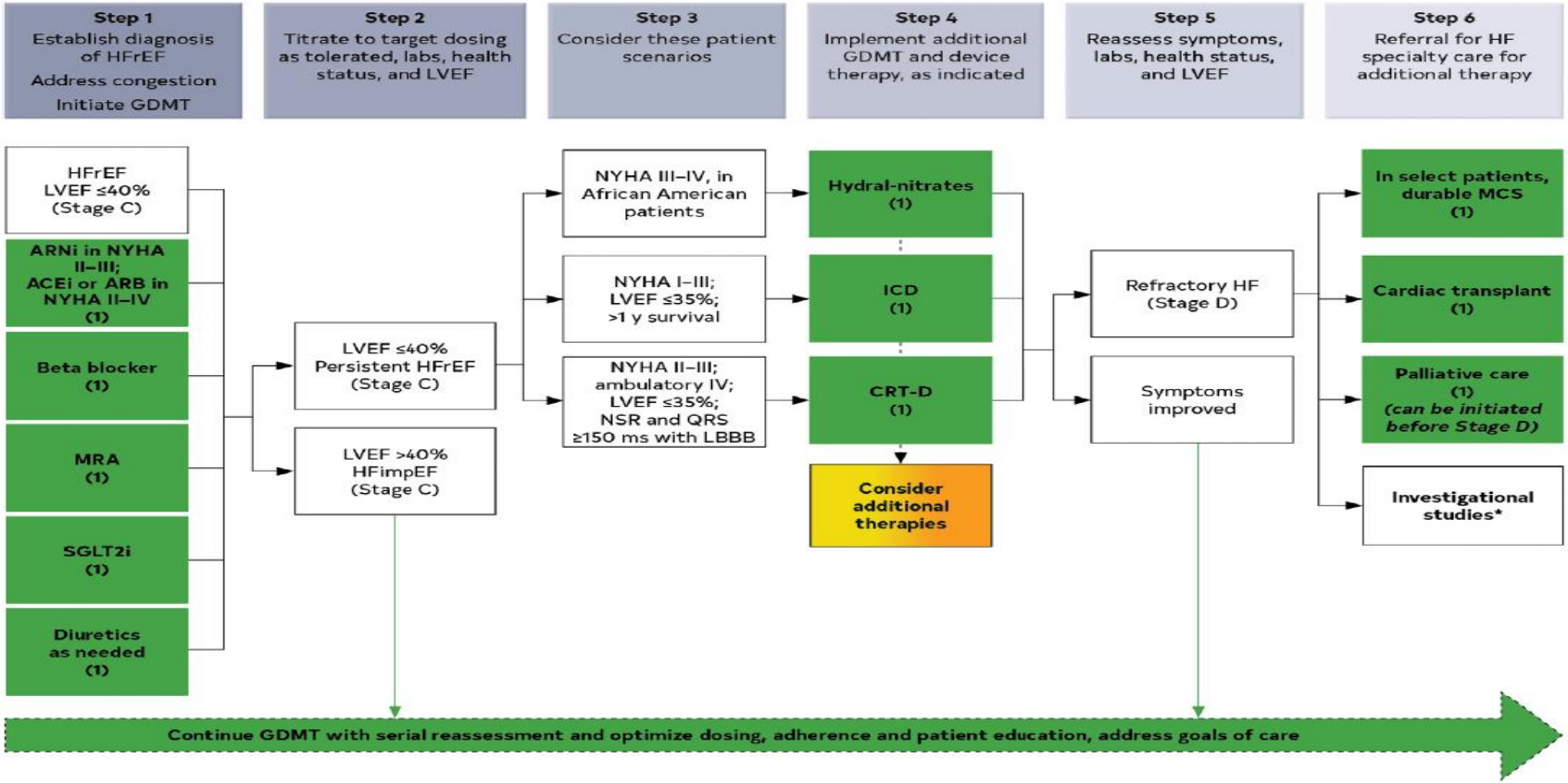


Foundational Pillars for Guideline Directed Medical Therapy



- All agents are initiated in parallel.
- Then up-titration in one, two or three steps, as required.
- Additional therapies may be considered.

GDMT Options for HFrEF



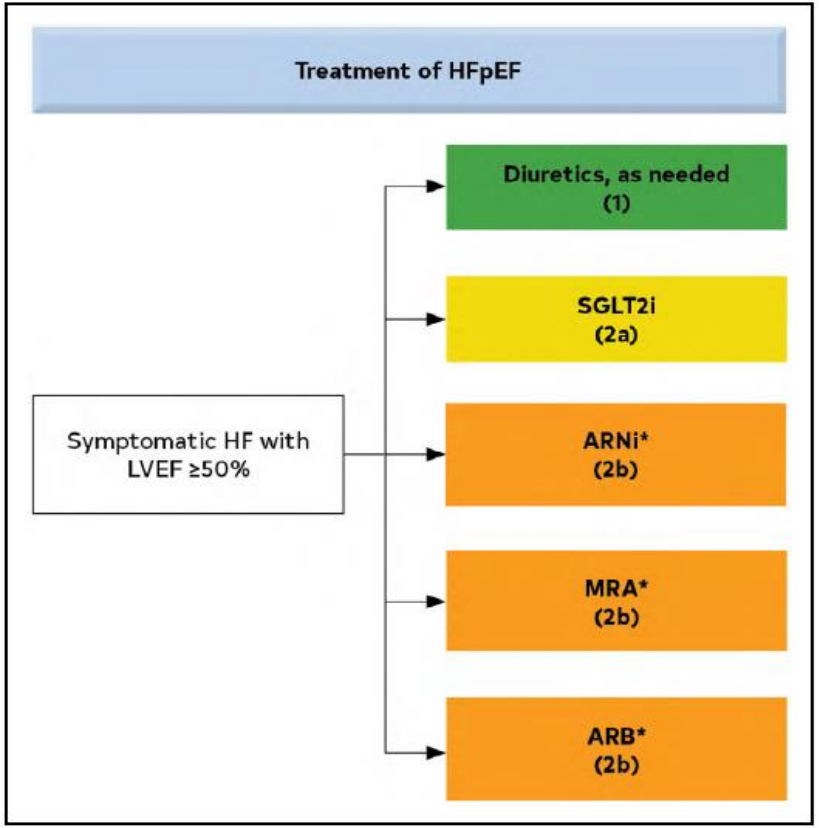
Do not routinely stop GDMT during hospitalization

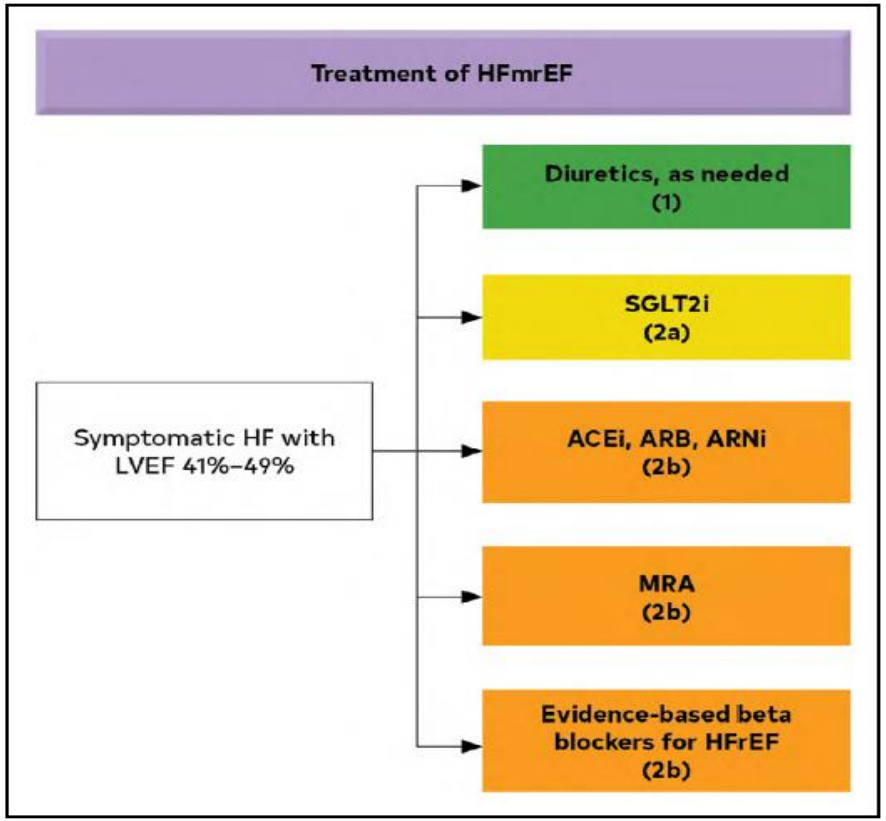
9.2. Maintenance or Optimization of GDMT During Hospitalization

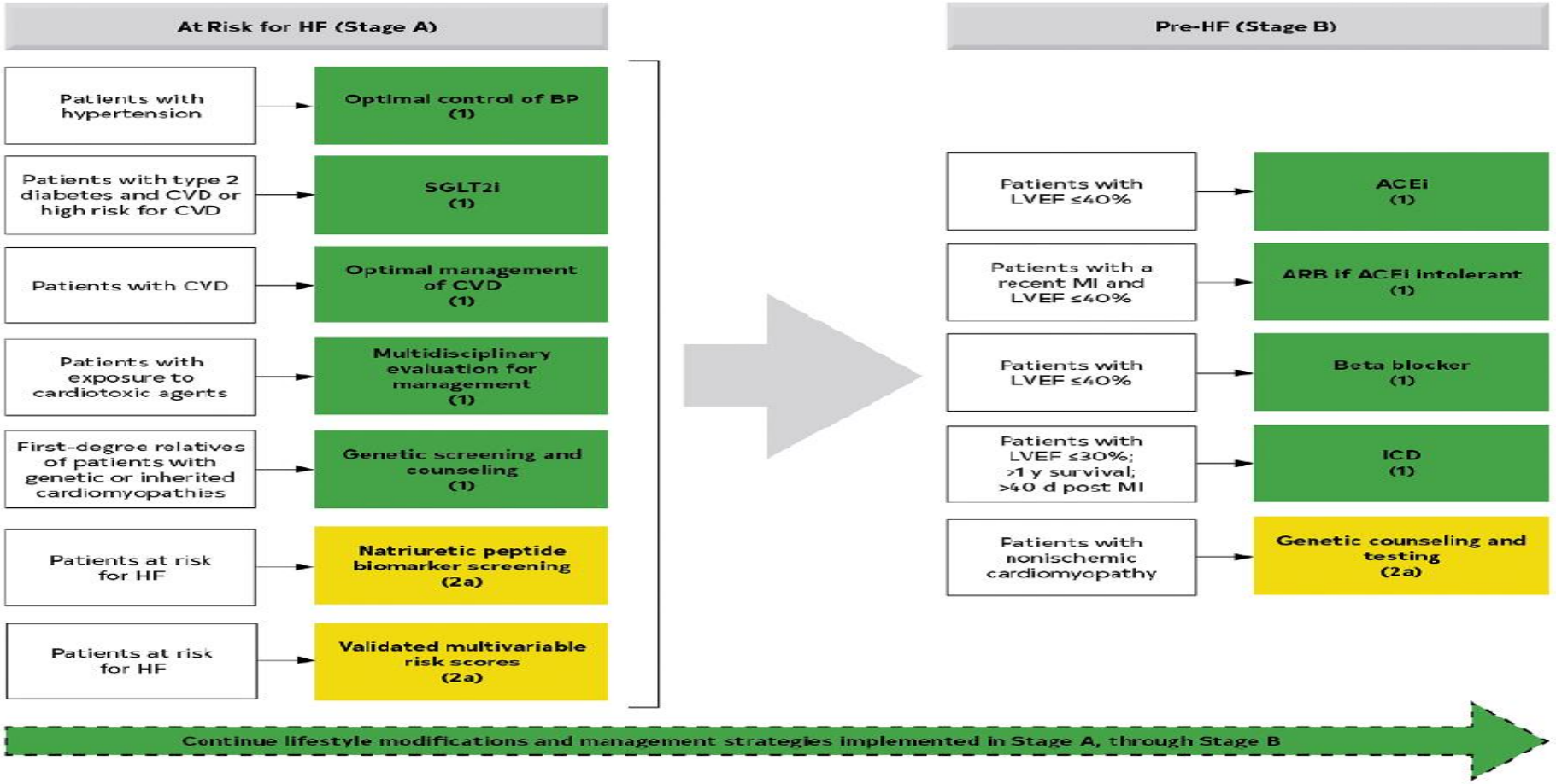
Recommendations for Maintenance or Optimization of GDMT During Hospitalization
Referenced studies that support the recommendations are summarized in the Online Data Supplements.

COR	LOE	Recommendations
1	B-NR	1. In patients with HFrEF requiring hospitalization, preexisting GDMT should be continued and optimized to improve outcomes, unless contraindicated.[1–5]
1	B-NR	2. In patients experiencing mild decrease of renal function or asymptomatic reduction of blood pressure during HF hospitalization, diuresis and other GDMT should not routinely be discontinued.[6–11]
1	B-NR	3. In patients with HFrEF, GDMT should be initiated during hospitalization after clinical stability is achieved.[2,3,5,12–18]
1	B-NR	4. In patients with HFrEF, if discontinuation of GDMT is necessary during hospitalization, it should be reinitiated and further optimized as soon as possible.[19–22]

GDMT Options for HFpEF, HFmrEF

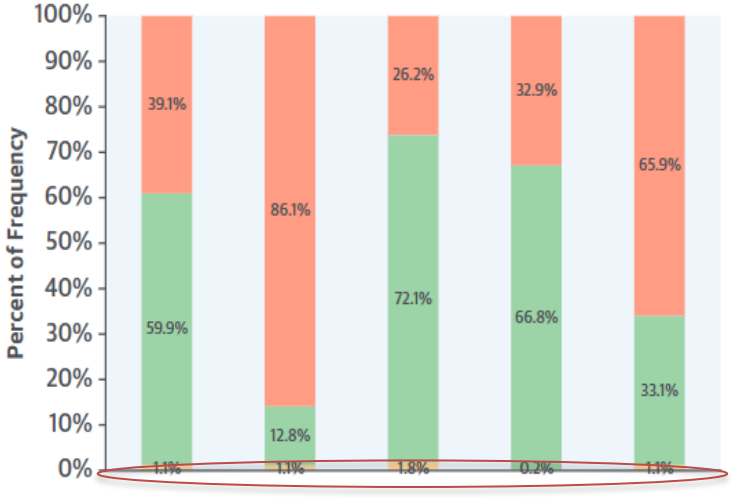





At Risk for HF (Stage A)
Patients with hypertension
Optimal control of BP (1)
Patients with type 2 diabetes and CVD or high risk for CVD
SGLT2i (1)
Patients with CVD
Optimal management of CVD (1)
Patients with exposure to cardiotoxic agents
Multidisciplinary evaluation for management (1)
First-degree relatives of patients with genetic or inherited cardiomyopathies
Genetic screening and counseling (1)
Patients at risk for HF
Natriuretic peptide biomarker screening (2a)
Patients at risk for HF
Validated multivariable risk scores (2a)
Pre-HF (Stage B)
Patients with LVEF ≤40%
ACEi (1)
Patients with a recent MI and LVEF ≤40%
ARB if ACEi intolerant (1)
Patients with LVEF ≤40%
Beta blocker (1)
Patients with LVEF ≤30%; >1 y survival; >40 d post MI
ICD (1)
Patients with nonischemic cardiomyopathy
Genetic counseling and testing (2a)
Continue lifestyle modifications and management strategies implemented in Stage A, through Stage B

Underutilization of GDMT

A



	ACEI/ARB	ARNI	ACEI/ARB/ ARNI	Beta-Blocker	MRA
Without Contraindication and Not Treated	1374	3029	920	1159	2317
Treated	2107	452	2536	2351	1163
With Contraindication	37	37	62	8	38

- Quadruple HF Therapy
- RR 72.9%
- ARR 25.5
- NNT 3.9
- 24 months

Greene et al.2018 Medical Therapy for Heart Failure With Reduced Ejection Fraction: The CHAMP-HF Registry. JACC: HF

Basel N *JAMA Cardiol* 2020

Underutilization of GDMT in Black, Hispanic and American Indian patients

- 11% and 18% of eligible Black patients were on H/I and ARNI (CHAMP-HF)
- Hispanic patients less likely to be treated with ARNI, evidence-based BB or mineralocorticoid receptor antagonists (CHAMP-HF)
- Black and female patients and patients with low socioeconomic status less likely to receive SGLT2i (Optum Clinformatics Data Mart)

Longitudinal use of hydralazine/nitrate and sacubitril/valsartan by race

Months	Black			Nonblack		
	On study	Hydralazine/Nitrate	Sacubitril/Valsartan	On study	Hydralazine/Nitrate	Sacubitril/Valsartan
0	853	11%	18%	3,955	1%	15%
1	822	11%	18%	3,861	1%	15%
3	791	12%	19%	3,731	1%	15%
6	655	12%	18%	3,228	1%	14%
12	411	13%	18%	2,186	2%	13%

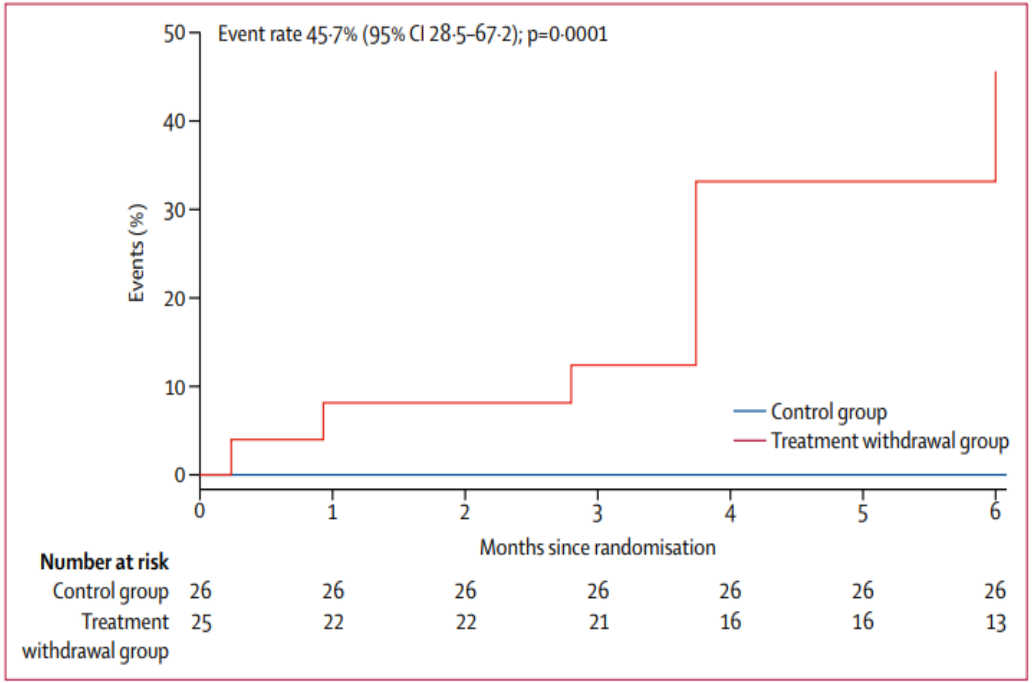
Eberly L et al *JAMA Netw Open* 2020

Greene et al *JACC* 2018

Giblin et al *Am J Cardiol* 2019

If my EF recovers, can I stop my HF meds doc?

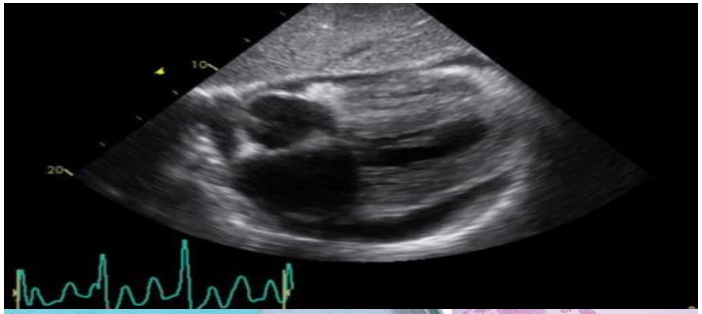
- High rate of relapse (44%) and higher HR of DCM patients with discontinuation of GDMT
- GDMT should NOT be stopped in HFimpEF even without symptoms

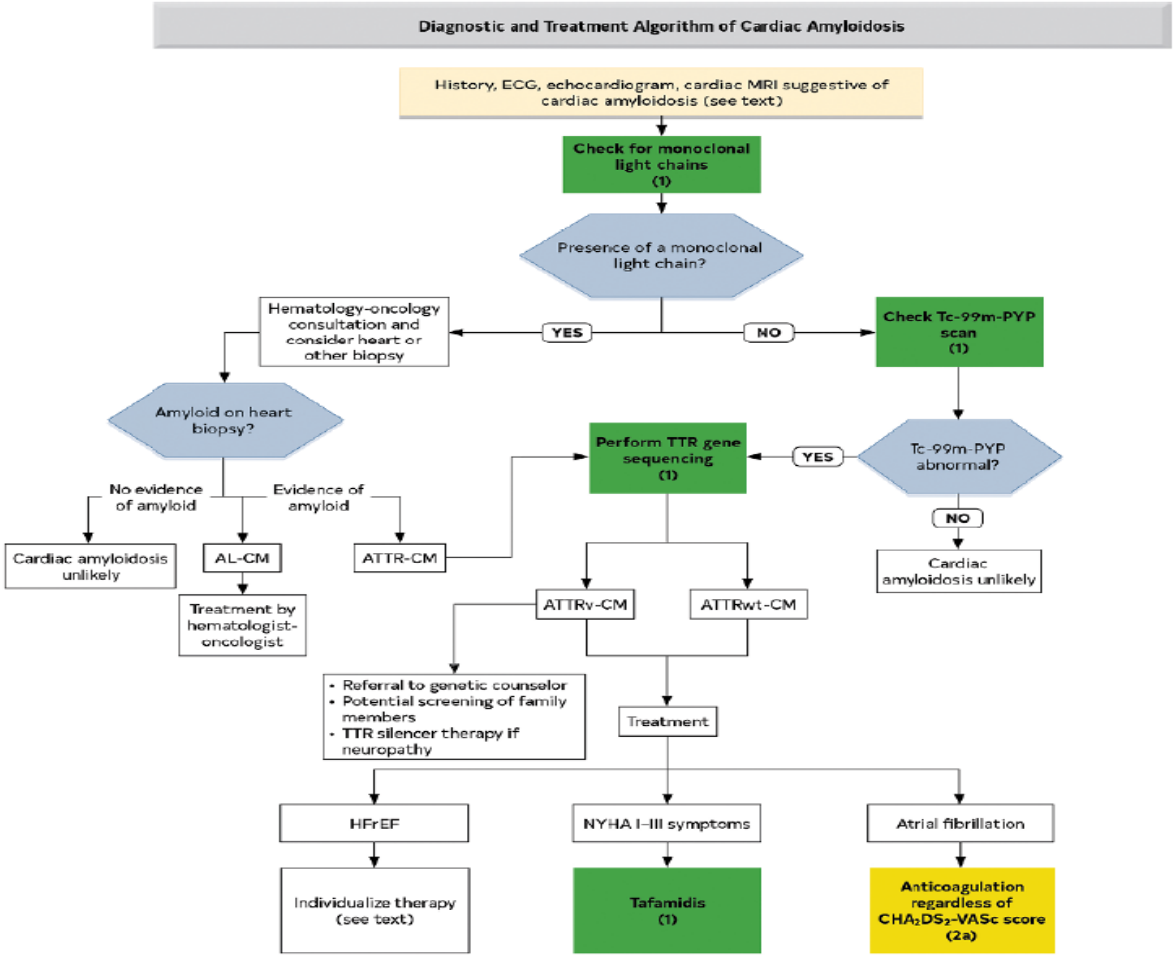


Value-Based Statements

- High Value Therapies (<$60,000 quality-adjusted life year gained:
  - HF GDMT - *ARNi, ACEi, ARB, Beta blocker, MRA,*
  - Hydralazine/Isosorbide dinitrate in African Americans,
  - Implantable cardioverter-defibrillator (ICD)
  - Cardiac resynchronization therapy
- Intermediate Value
  - SGLT2i
  - Cardiac transplantation
- High-Cost QALY Gained
  - Tafamidis (>$180,000 QALY gained)
- Uncertain Value:
  - *Mechanical circulatory support*
  - *Pulmonary artery pressure monitoring*

Timely Diagnosis/ Treatment of Cardiac Amyloid





Donnelly et al. *CCJM* 2017

Indiana University Health

Timely Referral for Advanced HF

8. STAGE D (ADVANCED) HF

8.1. Specialty Referral for Advanced HF

Recommendation for Specialty Referral for Advanced HF		
COR	**LOE**	**Recommendation**
1	C-LD	1. In patients with advanced HF, when consistent with the patient's goals of care, timely referral for HF specialty care is recommended to review HF management and assess suitability for advanced HF therapies (eg, LVAD, cardiac transplantation, palliative care, and palliative inotropes).[1–6]

8.5. Cardiac Transplantation

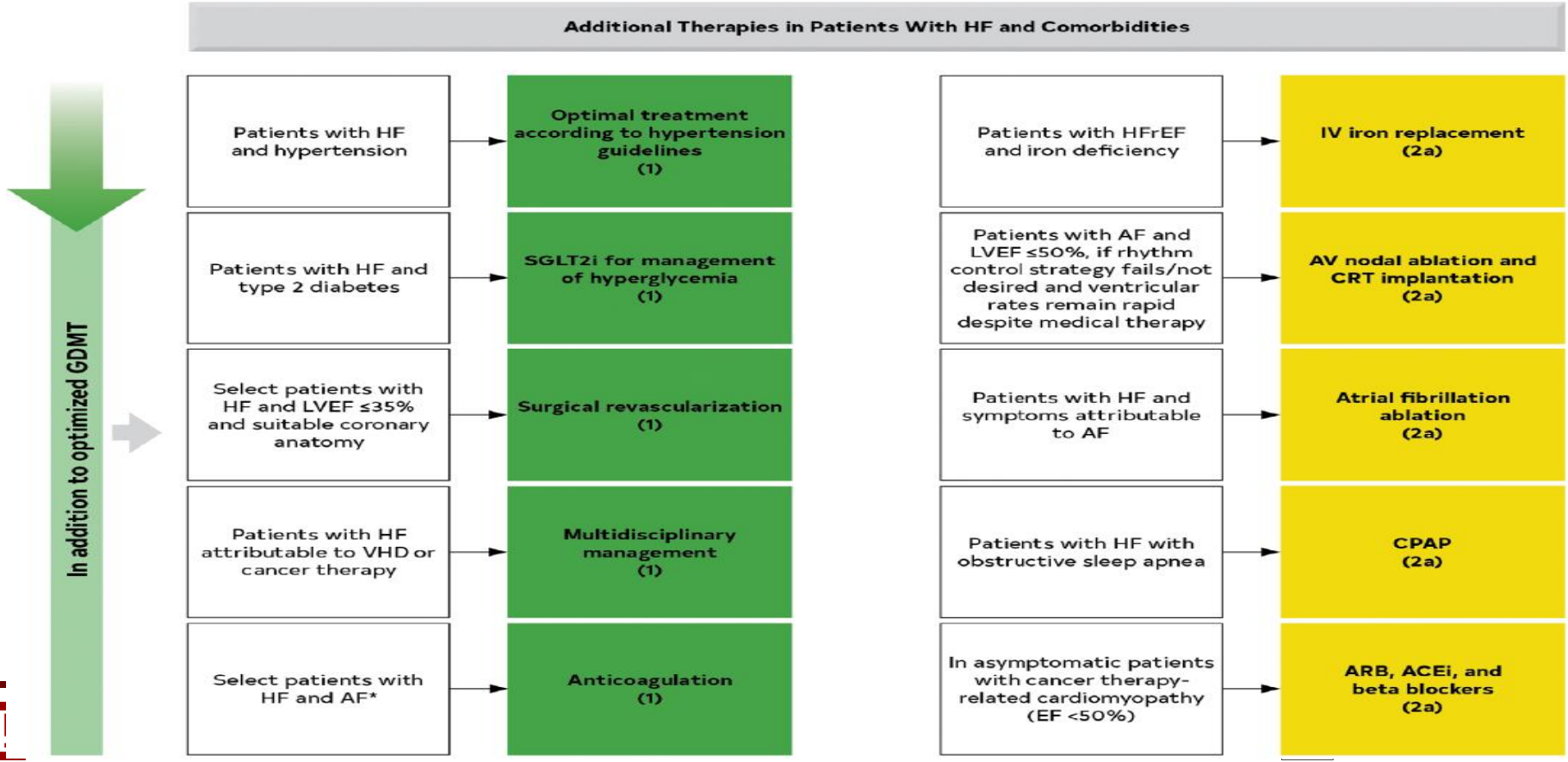
Recommendation for Cardiac Transplantation		
COR	**LOE**	**Recommendation**
1	C-LD	1. For selected patients with advanced HF despite GDMT, cardiac transplantation is indicated to improve survival and QOL.[1–3]
Value Statement: Intermediate Value (C-LD)		2. In patients with stage D (advanced) HF despite GDMT, cardiac transplantation provides intermediate economic value.[4]

8.4. Mechanical Circulatory Support

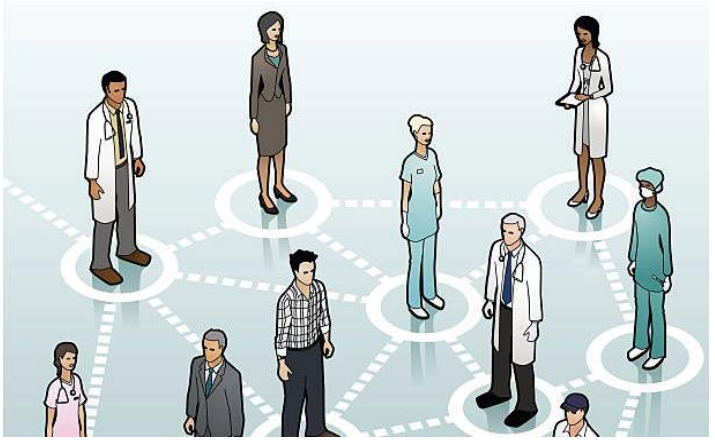
Recommendations for Mechanical Circulatory Support Referenced studies that support the recommendations are summarized in the Online Data Supplements.		
COR	**LOE**	**Recommendations**
1	A	1. In select patients with advanced HFrEF with NYHA class IV symptoms who are deemed to be dependent on continuous intravenous inotropes or temporary MCS, durable LVAD implantation is effective to improve functional status, QOL, and survival.[1–18]
2a	B-R	2. In select patients with advanced HFrEF who have NYHA class IV symptoms despite GDMT, durable MCS can be beneficial to improve symptoms, improve functional class, and reduce mortality.[2,4,7,10,12–17,19]
Value Statement: Uncertain Value (B-NR)		3. In patients with advanced HFrEF who have NYHA class IV symptoms despite GDMT, durable MCS devices provide low to intermediate economic value based on current costs and outcomes.[20–24]
2a	B-NR	4. In patients with advanced HFrEF and hemodynamic compromise and shock, temporary MCS, including percutaneous and extracorporeal ventricular assist devices, are reasonable as a "bridge to recovery" or "bridge to decision."[25–29]

Median survival of adult transplant recipients is >12 years; versus <2 years for patients with stage D HF without advanced therapies.

Management of Co-morbidities in HF with Adjunctive Therapies



COR	RECOMMENDATIONS
1	In vulnerable patient populations at risk for health disparities, HF risk assessments and multidisciplinary management strategies should target both known risks for CVD and social determinants of health, as a means toward elimination of disparate HF outcomes.



COR	RECOMMENDATIONS
1	Evidence of health disparities should be monitored and addressed at the clinical practice and the health care system levels.

Abbreviations: CVD indicates cardiovascular disease; and HF, heart failure.

Future Directions

- Death of “the EF” as a factor in HF therapeutics
- SGLT2i across the spectrum of HF
- Role of newer therapies – *soluble guanylate cyclase stimulators, cardiac-specific myosin activators, cardiac myosin inhibitors*
- Emerging role of pulmonary pressure monitoring
- Machine learning in HF risk prediction